IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: Martin W. Rupich et al.	Art Unit	: 1735
Serial No.	: 10/758,710	Examiner	:
Filed	: January 16, 2004	Conf. No.	: 6546
Title	: OXIDE FILMS WITH NANODOT FLUX PINNING CENTERS		

MAIL STOP APPEAL BRIEF-PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

BRIEF ON APPEAL

(1) Real Party in Interest

The real party in interest in the above application is American Superconductor Corporation.

(2) Related Appeals and Interferences

The Appellant is not aware of any appeals or interferences related to the above-identified patent application.

(3) Status of Claims

This is an appeal from the decision of the Examiner in an Office Action dated February 16, 2011, rejecting claims 1, 3-7, 9-18, and 70-72; and an Advisory Action dated April 27, 2011, maintaining the rejection of claims 1, 3-7, 9-18, and 70-72. The claims of the invention have been twice rejected.

Claims 2, 8, and 19-69 have been cancelled.

Claims 1, 3-7, 9-18, and 70-72 are pending in this application and are the subject of this appeal. In particular, the status of the pending claims is as follows:

Claims 1, 3, 6, 7, 9-18, 70, 71, and 72 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Riley (WO 01/08169) in view of Jin ("Superconducting properties…").

Claims 4, 5, and 12-17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Riley (WO 01/08169) in view of Jin ("Superconducting properties of…") and Weinstein (US 6,869,915).

Claim 18 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Riley (WO 01/08169) in view of Jin ("Superconducting properties of…") and Feenstra (US 5,972,847).

(4) Status of Amendments

Appellant last amended the claims in response to the Office Action of February 16, 2011. All amendments have been entered. The pending claims are found below as a Claims Appendix.

Appellant filed a Notice of Appeal on July 14, 2011.

(5) Summary of Claimed Subject Matter

Improvement in the critical current density of an oxide superconductor film can be achieved by improving the flux pinning of the superconducting vortices, which is the underlying mechanism for high critical current density in high temperature superconducting materials ([0005]).

In general, a method is described that relates to producing an oxide superconductor film that contains one or more defects that serve as flux pinning centers. A solution based deposition process is used to obtain an oxide superconductor film in which at least one of the elements of the oxide superconductor is partially replaced by a suitable dopant ([0044]). Any of the rare earth elements, alkaline earth metals, or transition metals in the oxide superconductor can be replaced by the dopant. The presence of the dopant introduces stresses that serve as flux pinning centers ([0044]). In one example, the dopant component replaces up to 50 atomic percent of the rare earth metal. In another example, a combination of two different dopant elements is used, where a first of the dopant elements partially replaces the rare earth metal and a second of the dopant elements partially replaces the alkaline earth metal.

In Applicant's method, a precursor solution is disposed onto a substrate to form a precursor film. The precursor solution contains precursor components to a rare earth / alkaline earth metal / transition metal oxide, including a salt of a rare earth element, a salt of an alkaline earth metal, and a salt of a transition metal. The precursor solution also contains a dopant component including a dopant metal. The dopant metal partially replaces the rare earth of the rare earth / alkaline earth metal / transition metal oxide in the precursor solution.

The precursor solution is treated to form an intermediate metal oxyfluoride film, which is then heated to form an oxide superconductor. The oxide superconductor contains the dopant metal and includes one or more defects that serve as flux pinning centers.

The subject matter of the application is claimed in independent claims 1 and 72. Claims 3-7, 9-18, and 71 depend from independent claim 1. The independent claims are supported in the Specification at least as indicated in the following table:

CLAIM	SUPPORT
Claim 1 A method for producing a thin film comprising:	
disposing a precursor solution onto a substrate to form a precursor film, the precursor solution comprising:	[0034]-[0035], [0051] [0146]-[0147]
precursor components to a rare earth/alkaline earth metal/transition metal oxide comprising a salt of a rare earth element, a salt of an alkaline earth metal, and a salt of a transition metal in one or more solvents, wherein at least one of the salts is a fluoride-containing salt, and	[0035]-[0037] [0146]-[0147]
a dopant component comprising a dopant metal, wherein the dopant metal partially replaces the rare earth of the rare earth/alkaline earth metal/transition metal oxide in the precursor solution, wherein the dopant component comprises sufficient dopant metal to replace up to 50 atomic percent of the rare earth metal of the rare earth/alkaline earth metal/transition metal oxide;	[0044], [0045] [0146]-[0147]

treating the precursor film to form an intermediate metal oxyfluoride film including the rare earth, the alkaline earth metal, the transition metal and the dopant metal of the precursor solution, and	[0052]-[0060] [0146]-[0147]
heating the intermediate film to form an oxide superconductor that contains one or more defects that serve as flux pinning centers, wherein the oxide superconductor comprises the dopant metal.	[0062]-[0066] [0146]-[0147]
Claim 72 A method for producing a thin film comprising:	
disposing a precursor solution onto a substrate to form a precursor film, the precursor solution comprising:	[0034]-[0035], [0051] [0146]-[0147]
precursor components to a rare earth/alkaline earth metal/transition metal oxide comprising a salt of a rare earth element, a salt of an alkaline earth metal, and a salt of a transition metal in one or more solvents, wherein at least one of the salts is a fluoride-containing salt, and	[0035]-[0037] [0146]-[0147]

a dopant component comprising a first dopant metal and a second dopant metal, wherein the first dopant metal partially replaces the rare earth of the rare earth/alkaline earth metal/transition metal oxide in the precursor solution, and wherein the second dopant metal partially replaces the alkaline earth metal of the rare earth/alkaline earth metal/transition metal oxide in the precursor solution;	[0044], [0045] [0146]-[0147]
treating the precursor film to form an intermediate metal oxyfluoride film including the rare earth, the alkaline earth metal, the transition metal, the first dopant metal, and the second dopant metal of the precursor solution, and	[0052]-[0060] [0146]-[0147]
heating the intermediate film to form an oxide superconductor that contains one or more defects that serve as flux pinning centers, wherein the oxide superconductor comprises the first dopant metal and the second dopant metal.	[0062]-[0066] [0146]-[0147]

(6) Grounds of Rejection to be Reviewed on Appeal

Claims 1, 3, 6, 7, 9-18, 70, 71, and 72 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Riley (WO 01/08169) in view of Jin ("Superconducting properties of...").

Claims 4, 5, and 12-17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Riley (WO 01/08169) in view of Jin ("Superconducting properties of...") and Weinstein (US 6,869,915).

Claim 18 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Riley (WO 01/08169) in view of Jin ("Superconducting properties of...") and Feenstra (US 5,972,847).

(7) Argument

The Law – Obviousness

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. (MPEP 2143)

All claim elements must be taught or suggested by the prior art. All words in a claim must be considered in judging the patentability of that claim against the prior art. ***In re Wilson***, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. ***In re Fine***, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)

Obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so. ***In re Kahn***, 441 F.3d 977, 986, 78 USPQ2d 1329, 1335 (Fed. Cir. 2006). "Rejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." ***KSR International Co. v. Teleflex Inc.***, 550 U.S. at ___, 82 USPQ2d, 1385, 1396 quoting ***In re Kahn***, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006). Although KSR rejected a rigid application of the teaching, suggestion or motivation test in an obviousness inquiry, the Federal Circuit noted that the Supreme Court still "acknowledged the importance of identifying 'a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in a way the claimed new invention does' in an obviousness determination." Id. at 1356-1357. ***P&G v. Teva Pharms. USA, Inc.***, 536 F. Supp. 2d 476 (US Dist 2008).

It is impermissible to use the claims as a frame, and the references as a mosaic, to pick and choose selected pieces, out of context, to reconstruct the invention. ***Northern Telecom v. Datapoint***, 908 F.2d 931 (CAFC 1990). In order to combine references, the Examiner must show some motivation, suggestion, or teaching of the desirability of making the combination. ***In re Dembiczak***, 50 USPQ 2d 1614, 1617 (CAFC 1999). It is well established that there must be some logical reason apparent from the evidence or record to justify combination or modification of references. ***In re Regal***, 526 F.2d 1399 188, U.S.P.Q.2d 136 (C.C.P.A. 1975).

Even if all of the elements of claims are disclosed in various prior art references, the claimed invention taken as a whole cannot be said to be obvious without some reason given in the prior art why one of ordinary skill in the art would have been prompted to combine the teachings of the references to arrive at the claimed invention. ***In re Regal***, 526 F.2d 1399 188, U.S.P.Q.2d 136 (C.C.P.A. 1975). Even if the cited references show the various elements suggested by the Examiner in order to support a conclusion that it would have been obvious to combine the cited references, the references must either expressly or impliedly suggest the claimed combination or the Examiner must present a convincing line of reasoning as to why one skilled in the art would have found the claimed invention obvious in light of the teachings of the references. ***Ex Parte Clapp***, 227 U.S.P.Q.2d 972, 973 (Board. Pat. App. & Inf. 985).

A statement that modifications of the prior art to meet the claimed invention would have been "'well within the ordinary skill of the art at the time the claimed invention was made'" because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. ***Ex parte Levengood***, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993).

A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. ***W.L. Gore & Associates, Inc. v. Garlock, Inc.***, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). When the prior art teaches away from combining certain known elements,

discovery of successful means of combining them is more likely to be nonobvious."*KSR*, 550 U.S. at ___, 82 USPQ2d at 1395.

Claim 1

For the purposes of this appeal only, claims 1, 3, 6, 7, 9-19, and 70-71 may be treated as standing or falling together. Claim 1 is representative of this group.

Claim 1 is directed to a method for producing a thin film. The method includes disposing a precursor solution onto a substrate to form a precursor film. The precursor solution includes precursor components to a rare earth/alkaline earth metal/transition metal oxide comprising a salt of a rare earth element, a salt of an alkaline earth metal, and a salt of a transition metal in one or more solvents. At least one of the salts is a fluoride-containing salt. The precursor solution also includes a dopant component including a dopant metal. The dopant metal partially replaces the rare earth of the rare earth/alkaline earth metal/transition metal oxide in the precursor solution. The dopant component comprises sufficient dopant metal to replace up to 50 atomic percent of the rare earth metal of the rare earth/alkaline earth metal/transition metal oxide.

The method of claim 1 further includes treating the precursor film to form an intermediate metal oxyfluoride film including the rare earth, the alkaline earth metal, the transition metal and the dopant metal of the precursor solution and heating the intermediate film to form an oxide superconductor that contains one or more defects that serve as flux pinning centers, wherein the oxide superconductor comprises the dopant metal.

Riley appears to describe a method for making a coated conductor. The Examiner acknowledges that Riley does not disclose a precursor solution that contains, among other features, "a dopant component comprising a dopant metal, wherein the dopant metal partially replaces the rare earth of the rare earth/alkaline earth metal/transition metal oxide in the precursor solution," but relies on Jin to describe this feature.

As discussed in more detail below, we disagree with the Examiner's reliance on Jin as disclosing the feature acknowledged as missing from Riley. In particular, we

submit that one of ordinary skill in the art would not have thought to combine Jin's teachings with Riley's methods. Furthermore, the claimed method achieves an unexpected result that is contrary to the teachings of Jin.

1. Jin teaches away from a dopant replacing the rare earth metal

Jin appears to describe an investigation of the "[s]uperconducting properties of the $YBa_2Cu_3O_{7-\delta}$ compound with partial rare earth substitution" (Abstract). However, Jin concludes that partial substitution on rare earth sites does not lead to significant flux pinning enhancement, and suggests that substitution on other sites may lead to better results:

> The result of the present work with insignificant flux pinning enhancement by Y-site substitution suggests that future efforts should perhaps be concentrated on Ba-, Cu-, or O-site substitutions (p. 78, col. 2).

That is, Jin advises readers that rare earth substitution is unable to generate meaningfully enhanced flux pinning behavior. We submit that given Jin's conclusions, one of ordinary skill in the art would not have considered using a dopant metal that partially replaces the rare earth, as Jin had already shown unsuccessful results.

In the Office Action issued on February 16, 2011 (p. 4), the Examiner makes the following statement:

> However, the remarks of the Office Action mailed 3/31/10 at pages 2-3 is incorporated herein by reference. It is reiterated that a reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill the art, including nonpreferred embodiments. Merck & Co. v. Biocraft Laboratories, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989). See also Upsher-Smith Labs. v. Pamlab, LLC, 412 F.3d 1319, 1323, 75 USPQ2d 1213, 1215 (Fed. Cir. 2005). MPEP 2123 (I).

The Examiner's position is set forth in more detail in the office action issued March 31, 2010:

> However, it appears that Jin teaches that superconductors with the rare earth site partially substituted do have a higher Jc than that of a control Y-123 superconductor (Table II, page 78). Jin does not appear to teach away from chemical substitution even though the reference recites that "future efforts should be concentrated on Ba-, Cu, or O-site substitution." This recitation seems to point out that chemical substitution in merely a non-preferred embodiment. Jin does not teach that rare earth site substitution is disparaged as a bad result, only that other site substitutions may yield a better result. A reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill the art, including nonpreferred embodiments. MPEP 2123 (I). To this point, "[a] known or obvious composition does not become patentable simply because it has been described as somewhat inferior to some other product for the same use." MPEP 2123 (I). In the instant case, amount of increase in the value of Jc (as a result of the rare earth element being substituted) described in Jin could be viewed by one of ordinary skill in the art as an improvement over the control Y-123

That is, the Examiner appears to be of the opinion that Jin's description of partial rare earth substitution is merely a nonpreferred embodiment.

However, Jin describes a number of factors that may affect flux pinning:

> The possible error in the grain size measurement could be as much as 50%. Also, the ΔM values may be dependent on other factors in addition to the grain size, such as the connectivity of the grains, or the nature of the boundaries … Different types of chemical substitution (e.g., on Ba-site), subtle changes in oxygen vacancy distribution, and other factors may also have some effect on flux pinning. *Considering all these possibilities, the observed improvement in ΔM and intragrain J_c by a factor of 2-3 in the present work may be viewed as relatively insignificant* (p. 78, col. 1, emphasis added).

That is, Jin concedes that many other factors in addition to rare earth substitution may be affecting the results. Indeed, it appears that Jin cannot even be certain that the observed

changes in ΔM and J_c are due to partial rare earth substitution. Given this uncertainty, we submit that Jin's use of partial rare earth substitution is not simply a nonpreferred embodiment. Rather, Jin recommends avoidance of partial rare earth substitution because he is not even sure that it is the rare earth substitution that is causing the (insignificant) effects on ΔM and J_c. In other words, Jin would have suggested to one of ordinary skill in the art to look to a dopant replacing an alkaline earth metal (e.g., Ba) or transition metal (e.g., Cu) atom, rather than a rare earth atom.

Taken together, the uncertainty of the cause of Jin's results and the conclusion that those results represent an insignificant improvement mean that Jin teaches away from the use of partial rare earth substitution for those looking to obtain a flux pinning enhancement. Because Jin suggests that partial rare earth substitution is to be avoided, we submit that one of ordinary skill in the art would not have looked to Jin for combination with the methods described in Riley. That is, neither Riley nor Jin, alone or in any proper combination, describes or suggests a precursor solution including, among other components, "a dopant component comprising a dopant metal, wherein the dopant metal partially replaces the rare earth of the rare earth/alkaline earth metal/transition metal oxide in the precursor solution," as recited in independent claim 1.

2. Applicant achieves an unexpected result

The Examiner argues that one of ordinary skill in the art would have found it obvious to include a dopant in Riley's precursor solution "to make a superconductor having a higher Jc than a YBCO superconductor without the substitution ... as taught by Jin" (Office Action issued September 16, 2010, p. 5).

In fact, based on the teachings of Jin, one of ordinary skill in the art would have expected that replacing one rare earth metal with another would have very little effect on Jc. Indeed, Jin advises readers to disregard the possibility of using a dopant to replace a rare earth metal:

> "The result of the present work with the *insignificant* flux pinning enhancements by Y-site substitution suggests that future efforts

should perhaps be concentrated on Ba-, Cu-, or O-site substitutions." (Jin, p. 78, col. 2, emphasis added).

That is, one of ordinary skill in the art armed with the teachings of Jin would have been discouraged from providing a dopant metal that "partially replaces the rare earth of the rare earth/alkaline earth metal/transition metal oxide in the precursor solution," as recited in claim 1, because of the insignificant flux pinning enhancement afforded by rare earth replacement.

However, in direct contradiction to Jin's predications, Applicant was able to obtain significant flux pinning enhancement. In effect, Applicant ignored Jin's advice to avoid rare earth replacement, and achieved an unexpected result counter to the teachings of Jin. Specifically, Applicant's result is unexpected because Jin already attempted partially replacing a rare earth metal with a dopant metal, discovered that such replacement was ineffective, and recommended that others try instead to substitute a dopant for some other constituent.

For at least the above reasons, we submit that independent claim 1 is patentable over Riley and Jin, alone or in any proper combination. Since claims 3, 6, 7, 9-19, and 70-71 depend from claim 1, they are patentable for at least the same reasons claim 1 is patentable. We therefore request that these claims be allowed.

Claim 72

Claim 72 is directed to a method for producing a thin film. The method includes disposing a precursor solution onto a substrate to form a precursor film. The precursor solution includes precursor components to a rare earth/alkaline earth metal/transition metal oxide comprising a salt of a rare earth element, a salt of an alkaline earth metal, and a salt of a transition metal in one or more solvents. At least one of the salts is a fluoride-containing salt. The precursor solution also includes a dopant component including a first dopant metal and a second dopant metal. The first dopant metal partially replaces the rare earth of the rare earth/alkaline earth metal/transition metal oxide in the precursor

solution. The second dopant metal partially replaces the alkaline earth metal of the rare earth/alkaline earth metal/transition metal oxide in the precursor solution.

The method of claim 1 further includes treating the precursor film to form an intermediate metal oxyfluoride film including the rare earth, the alkaline earth metal, the transition metal, the first dopant metal, and the second dopant metal of the precursor solution and heating the intermediate film to form an oxide superconductor that contains one or more defects that serve as flux pinning centers, wherein the oxide superconductor comprises the first dopant metal and the second dopant metal.

As discussed above, we submit that Jin teaches away from the use of partial rare earth substitution for those looking to obtain a flux pinning enhancement. Thus, consistent with the argument presented above in conjunction with claim 1, we also submit that neither Riley nor Jin, alone or in any proper combination, discloses or suggests a precursor solution including, among other components, "a dopant component comprising a first dopant metal and a second dopant metal, wherein the first dopant metal partially replaces the rare earth of the rare earth/alkaline earth metal/transition metal oxide in the precursor solution, and wherein the second dopant metal partially replaces the alkaline earth metal of the rare earth/alkaline earth metal/transition metal oxide in the precursor solution," as recited in claim 72.

Furthermore, as discussed above in conjunction with claim 1, Applicant's claimed method achieves an unexpected result directly contrary to the teachings of Jin.

For at least the above reasons, we submit that independent claim 72 is patentable over Riley and Jin, alone or in any proper combination, and thus respectfully request allowance of claim 72.

(8) Claims Appendix

1. (Previously Presented) A method for producing a thin film comprising:

disposing a precursor solution onto a substrate to form a precursor film, the precursor solution comprising:

precursor components to a rare earth/alkaline earth metal/transition metal oxide comprising a salt of a rare earth element, a salt of an alkaline earth metal, and a salt of a transition metal in one or more solvents, wherein at least one of the salts is a fluoride-containing salt, and

a dopant component comprising a dopant metal, wherein the dopant metal partially replaces the rare earth of the rare earth/alkaline earth metal/transition metal oxide in the precursor solution, wherein the dopant component comprises sufficient dopant metal to replace up to 50 atomic percent of the rare earth metal of the rare earth/alkaline earth metal/transition metal oxide;

treating the precursor film to form an intermediate metal oxyfluoride film including the rare earth, the alkaline earth metal, the transition metal and the dopant metal of the precursor solution, and

heating the intermediate film to form an oxide superconductor that contains one or more defects that serve as flux pinning centers, wherein the oxide superconductor comprises the dopant metal.

2. (Cancelled)

3. (Previously Presented) The method of claim 1, wherein the dopant component comprises sufficient dopant metal to replace about 10 atomic % to about 30 atomic % of one or more rare earth and alkaline earth metal of the rare earth/alkaline earth metal/transition metal oxide.

4. (Previously Presented) The method of claim 1, wherein the dopant component comprises sufficient dopant metal to replace about 1 atomic % to about 10 atomic % of one or more rare earth and alkaline earth metal of the rare earth/alkaline earth metal/transition metal oxide.

5. (Previously Presented) The method of claim 1, wherein the dopant component comprises sufficient dopant metal to replace less than about 1 atomic % of one or more rare earth and alkaline earth metal of the rare earth/alkaline earth metal/transition metal oxide.

6. (Original) The method of claim 1, wherein treating the precursor film comprises comprising heating the film at a temperature in the range of about 190°C to about 650°C to decompose the precursor and dopant components of the precursor solution.

7. (Original) The method of claim 1, wherein treating the precursor film comprises comprising heating the film at a temperature in the range of about 190°C to about 400°C to decompose the precursor and dopant components of the precursor solution.

8. (Cancelled)

9. (Previously Presented) The method of claim 1, wherein the oxide superconductor comprises sufficient dopant metal to replace up to 50 atomic percent of one or more of the rare earth and alkaline earth metal of the oxide superconductor.

10. (Original) The method of claim 6, wherein heating the intermediate film comprises heating at a temperature in the range of about 700°C to about 825°C in a flowing gas environment having a total pressure of about 0.1 Torr to about 760 Torr and containing about 0.09 Torr to about 50 Torr oxygen and about 0.01 Torr to about 150 Torr water vapor and an inert gas with a pressure of about 0 Torr to about 750 Torr.

11. (Original) The method of claim 6, wherein heating the intermediate film comprises heating at a temperature in the range of about 700°C to about 825°C in a flowing gas environment having a total pressure of about 0.15 Torr to about 5 Torr and containing about 0.1 Torr to about 1 Torr oxygen and about 0.05 Torr to about 4 Torr water vapor.

12. (Previously Presented) The method of claim 10, wherein the intermediate film is heated to the heating temperature at a temperature ramp of about greater than 25°C per minute.

13. (Previously Presented) The method of claim 10, wherein the intermediate film is heated to the heating temperature at a temperature ramp of about greater than 100°C per minute.

14. (Previously Presented) The method of claim 10, wherein the intermediate film is heated to the heating temperature at a temperature ramp of about greater than 200°C per minute.

15. (Previously Presented) The method of claim 11, wherein the intermediate film is heated to the heating temperature at a temperature ramp of about greater than 25°C per minute.

16. (Previously Presented) The method of claim 11, wherein the intermediate film is heated to the heating temperature at a temperature ramp of about greater than 100°C per minute.

17. (Previously Presented) The method of claim 11, wherein the intermediate film is heated to the heating temperature at a temperature ramp of about greater than 200°C per minute.

18. (Original) The method of claim 6, wherein:

the oxide superconductor is disposed on a surface of a substrate, the substrate being biaxially oriented;

the oxide superconductor is biaxially oriented;

the oxide superconductor has a c-axis orientation that is substantially constant across its width, the c-axis orientation of the oxide superconductor being substantially perpendicular to the surface of the substrate.

19-69. (Canceled)

70. (Previously Presented) The method of claim 1, wherein the dopant comprises holmium.

71. (Previously Presented) The method of claim 1, wherein the dopant component further comprises a second dopant metal which partially replaces the alkaline earth metal of the rare earth/alkaline earth metal/transition metal oxide in the precursor solution.

72. (Previously Presented) A method for producing a thin film comprising:

disposing a precursor solution onto a substrate to form a precursor film, the precursor solution comprising:

precursor components to a rare earth/alkaline earth metal/transition metal oxide comprising a salt of a rare earth element, a salt of an alkaline earth metal, and a salt of a transition metal in one or more solvents, wherein at least one of the salts is a fluoride-containing salt, and

a dopant component comprising a first dopant metal and a second dopant metal, wherein the first dopant metal partially replaces the rare earth of the rare earth/alkaline earth metal/transition metal oxide in the precursor solution, and wherein the second dopant metal partially replaces the alkaline earth metal of the rare earth/alkaline earth metal/transition metal oxide in the precursor solution;

treating the precursor film to form an intermediate metal oxyfluoride film including the rare earth, the alkaline earth metal, the transition metal, the first dopant metal, and the second dopant metal of the precursor solution, and

heating the intermediate film to form an oxide superconductor that contains one or more defects that serve as flux pinning centers, wherein the oxide superconductor comprises the first dopant metal and the second dopant metal.

(9) Evidence Appendix

None.

(10) Related Proceedings Appendix

None.

(11) Conclusion

The appeal brief fee in the amount of $620 and the Petition for the Extension of Time fee of $560 are being paid concurrently herewith on the Electronic Filing System (EFS) by way of Deposit Account authorization. Please apply all charges or credits to Deposit Account No. 50-4189, referencing Attorney Docket No. 30020-301001.

Respectfully submitted,

Date: November 9, 2011

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